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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/289,600	04/12/1999	AKIRA YAMAGUCHI	Q53967	8833

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EXAMINER	
LESPERANCE, JEAN E	

ART UNIT	PAPER NUMBER
2674	26

DATE MAILED: 11/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/289,600	YAMAGUCHI ET AL.	
	Examiner	Art Unit	
	Jean E Lesperance	2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29,31 and 35-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15,18,21-29,31 and 35-37* is/are rejected.

7)☒ Claim(s) *16,17,19 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 April 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claims 1-29, 31, and 35-37 are presented for examination.

Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-15, 18, 21-29, 31 and 35-37 are rejected under 35 U.S.C. 103 (a) as being unpatentable over patent # 5,739,808 ("Suga et al.") in view of patent # 5,872,554 ("Chang et al.").

As for claims 1 and 13, Suga et al. teach a data of one pixel shown in FIG. 4 can be displayed in a three-gradation display (level 0 to level 2) as shown in FIG. 5 (an image can be displayed with respective three-levels for each of RGB colors) by one pixel in FIG. 3 (original two pixels in the horizontal direction can be used as one pixel) (col.4, li.34-39) corresponding to a display device comprising a plurality of picture elements; driver IC at in formation line side and driver IC at scan line side Fig.1 (32 and 33) corresponding to *a cell signal generating means which generates*, the output value is determined as three values 0, 128 and 255. For example, in a case where the input data is value 100 as shown in FIG. 9, this value 100 is

larger than the threshold 85 and less than the threshold 170, therefore, an output value becomes 128. As result, a difference value -28 is appeared as an error between an input value and an output value (Col.5, Li 6-12) corresponding to *the average of the output luminance of all cell within each picture element,* the horizontal resolution of the display device is 4 times as large as that of the input image and the vertical resolution of the display device is twice as large as that of the input image, data of one pixel shown in FIG. 7 can be displayed in a nine-gradation display (level 0 to level 8) as shown in FIG. 8 corresponding to *wherein each picture element of said display device corresponds to a picture element,* the output value is determined as three values 0, 128 and 255. For example, in a case where the input data is value 100 as shown in FIG. 9, this value 100 is larger than the threshold 85 and less than the threshold 170, therefore, an output value becomes 128. As result, a difference value -28 is appeared as an error between an input value and an output value (Col.5, Li 6-12) corresponding to *wherein the output luminance of the plurality of picture elements of said display device express said image*. Accordingly, Suga et al. teach all the claimed limitations as recited in claim 1 with the exception of providing a monochromatic image display but teach that by utilizing thus feature, up to today, the FLCD has been widely applied to a display of DTP system or the like.

However, Chang et al. teach a method for simulating an N-level gray-scale image on a monochrome LCD screen comprises three steps (col. 2, li. 37-39) corresponding to *a monochromatic image display system.*

It would have been obvious to utilize the monochrome LCD screen as taught by Chang et al. in the display control method disclosed by Suga et al. because this would simulate gray scale images on the screen without presenting blinking effect to the user's eyes.

As for claims 2 and 7, Suga et al. teach the output value is determined as three values 0, 128 and 255. For example, in a case where the input data is value 100 as shown in FIG. 9, this value 100 is larger than the threshold 85 and less than the threshold 170, therefore, an output value becomes 128. As result, a difference value -28 is appeared as an error between an input value and an output value (Col.5, Li 6-12) corresponding *to the cell signal generating means generates cell signals so that the output luminance of cells and frames of the respective picture element of said display device and it is inherent for a picture element in a display device to be substantially uniform.*

As for claim 3, Suga et al. teach a three-gradation display (Figs.4 and 5) corresponding to *the output luminance of the cells of the respective element of the display change at the inclination according to the gradient vector of picture elements around the respective picture element corresponding to the cells.*

As for claims 4 and 5, Suga et al. a driver IC at information line side 32 and driver IC at scan line side 33 (Fig.1) corresponding to *the cell signal generating means intensity-modulates and time-modulates input signal levels to the respective cells independently of each other.*

As for claim 6, Suga et al. teach a frame data read out from the frame memory 102 is multi-value halftone processed by the halftone process unit 103 to become the gradation number

which is obtained from the main processing unit 106 (Col.4, li. 60-63) corresponding to *the cell signal generating means time-modulates in put signal levels to the respective cells by frame.*

As for claims 8 and 10, Suga et al. teach the horizontal resolution of the display device is 4 times as large as that of the input image and the vertical resolution of the display device is twice as large as that of the input image, data of one pixel shown in FIG. 7 can be displayed in a nine-gradation display (level 0 to level 8) as shown in FIG. 8 (an image can be displayed with respective nine-levels for each RGB color) by one pixel shown in FIG. 6 (original four pixels in the horizontal direction and two pixels in the vertical direction can be used as one pixel) (Col.4, li.47-56) corresponding to *the maximum number of tones which can be expressed by each cell per one frame is not smaller than 64 (6 bits) and 256 (8 bits).*

As for claim 9, Suga et al. teach FIGS. 14A to 14D are views for explaining the conversion for converting data into the ON/OFF data of the binary display device in a case where the gradation number is 3 as mentioned above. Among the input image data shown in FIG. 14A, the value of the input image data of a pixel x is 200. When this data is converted into data of 255 by executing a ternary halftone process, since this case corresponds to level 2 of a 3-gradation expression shown in FIG. 5, data is converted into such binary data as the both of two sub-pixels of the binary display device come to be lighted as shown in FIG. 14C (refer to FIG. 14D) (Col.5, Li.38-48) corresponding to *a tone number conversion means which carries out a tone number conversion processing on an input original monochromatic image signal , thereby generating said monochromatic image signal, wherein a number of tones represented by said*

monochromatic image signal is no greater than a number of tones which can be expressed by each respective picture element of said display device.

As for claim 11, Suga et al. teach the output value is determined as three values 0, 128 and 255 (Colo.5, li. 6-7) corresponding to *the display device expresses each picture element by three pixels.*

As for claim 12, Chang et al. teach a monochrome liquid crystal display (abstract).

As for claims 14 and 15, Suga et al. teach Fig.7 where two of the cells are the same and the difference level is higher than the next cell corresponding to *the maximum output level of one of said at least two cells is substantially the same as the output level difference per one level of the other.*

As for claim 18 and 29, Chang et al. teach a pulse at the start of the scanning of each row, and the SCP signal for shift clock synchronization that provides a series pulses for the synchronization of the display of each (page Fig.5) (column 5, lines 36-42); wherein each cell of said series of cells emits light in the same color(Fig.1), wherein the output luminance of the plurality of picture elements express said monochromatic image (column 2, lines 34-55). It is well know in the art a display device may include an output luminance of the cell, the flat panel, and a CIE chromaticity diagram.

As for claim 21-23, Suga et al. teach a fine and excellent displaying can be realized with a large-size screen. By utilizing thus feature, up to today, the FLCD has been widely applied to a display of DTP (desk top publishing) system or the like (Col.1, Li.52-55) which means that the

maximum luminance of each picture element can be in the range as claimed, a liquid crystal panel, and an organic EL panel.

As for claim 24-28, Chang et al. teach a pixel at the location (X,Y) on an (N+1)-level gray scale image, where X and Y represent the coordinates of a particular dot in a plane of the original gray scale image and N represent the level of the gray scale image, the corresponding dots on the N pages are to be assigned "black" or "white" according to the following rule (where Mod refers to the remainder after performing a division operation): Gray levels 0, 1, 2, m (Col.3, Li.45-66).

As for claim 31, Suga et al. teach an image can be displayed with respective three-levels for each of RGB colors by one pixel in FIG. 3 (original two pixels in the horizontal direction can be used as one pixel) where it is well known in the art for color display element to be formed of polyethylene terephthalate colored with anthraquinone dye.

As for claim 35-37, Chang et al. teach a monochrome LCD screen that is used to simulate a 4-level gray scale display. If a pixel on the original image has a gray level 0 (black) and can also be color blue, the corresponding dots (sub-pixels) on the three pages are all black (same color) (column 1, lines 38-52) and where the number of tones represented by said input signal monochromatic image signal is greater than said number of tones represented by said monochromatic image signal.

Allowable Subject Matter

Claims 16, 17, 19, and 20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication allowable subject matter: the claimed invention is directed to a monochromatic image display system. Claim 16 identifies a uniquely distinct feature "the display device is a liquid crystal panel provided with monochromatic filters which are different transmittance and respectively formed on said at least two cells for each picture element so that the maximum output levels of said at least two cells become different from each other". Claim 17 identifies a uniquely distinct feature "the display device is an organic EL panel in which said at least two cells for each picture element emit light in the same color at different luminance for a given signal level, wherein said given signal level indicates an output luminance of the respective picture element having said at least two cells". Claim 19 identifies a uniquely distinct feature "the display device further comprises at least one of elements including a substrate, a face plate, a diffuser panel, a color filter, a diffuser film, a collimator film, a prism film and a polarizing film which are colored to a predetermined color". Claim 20 identifies a uniquely distinct feature "an area modulation means which controls the output luminance of each picture element by selectively turning on and off input signals to respective cells, for each picture element, independently of each other, a time modulation means which drives the respective cells for each picture element in a time division system, and an intensity modulation means which controls input

signal levels to the respective cells for each picture element independently of each other, wherein the cells are driven so that the maximum luminance of each picture element is in the range of 100cd/m2 to 10000cd/m2".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean Lesperance whose telephone number is (703) 308-6413. The examiner can normally be reached on from Monday to Friday between 8:OOAM and 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Hjerpe, can be reached on (703) 305-4709 .

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Jean Lesperance

Date 11-13-2003

Art Unit 2674

RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600